REMARKS

The Final Office Action, mailed July 1, 2009, considered and rejected claims 1, 3-4, 6-14, 16-17, 21-25, 27-35, and 37-39 under 35 U.S.C. § 103(a). Claims 1, 3-4, 6-12, 22-25, 27-35, and 37-39 were rejected as being unpatentable over Wotring et al. (US Pat. No. 6,853,997) in view of Wang et al. (US Pat. No. 6,907,433), further in view of Ludwig et al. (US Pat. No. 6,006,230), further in view of Chua (US Pat. App. No. 2005/0210124) and further in view of Koller et al. (US Pat. App. No. 2002/0103793). Claims 13-14, 16-17, and 21 were rejected as being unpatentable over Wang in view of Bigus et al. (US Pat. No. 7,136,843) further in view of Ludwig, Chua, and Koller.

By this response, claims 34-35 and 39 have been amended, claims 1, 3-4, 6-12, 22-25, 27-33, and 37-38 have been cancelled, and claims 40-51 have been added, such that claims 34-35, 37, and 39-51 are pending, of which claims 34, 39, and 40 are the independent claims at issue. Support for the claim amendments and new claims are found throughout the application, including the disclosure found on pg. 6 line 27-pg. 7 line 15, pg. 10 lines 2-26, pg. 12 line 20-pg. 13 line 16, pg. 14 lines 22-25, pg. 16 line 12-pg. 17 line 3, pg. 18 lines 17-21, pg. 19 lines 10-26, pg. 20 lines 3-18 and Figure 1-6, 8-11, and 14. Additionally, claim 44 contains the same material contained in canceled claims 10 and 30, claim 45 contains the same material contained in canceled claim 31, and claim 46 contains the same material contained in canceled claim 21.

As reflected by the claims, the present invention is generally directed to embodiments for generating an object schema to be used in mapping between a relational database and objects in an object-oriented program language. Program code is received that describes one or more classes which define objects. Members of each class are described, including compound members which can contain additional members (including compound members) in addition to at least one of a plurality of attributes. The relationships between the classes are specified and input is received from a developer through an input component. The object schema is then generated using the input received from the developer. The object schema contains first, second, and third data structures. The first data structure contains attributes describing the one or more classes, and contains at least a persistence service attribute. The second data structure contains attributes describing the members of each class, and contains at least a hidden attribute, a key generator attribute, and a key generator parameter attribute, and at least one of the members contains an alias attribute. The third data structure describes the relationships between the one or more classes, and contains at least a relationship name and relationship type attribute. A relational schema and a mapping schema are also provided in addition

to the object schema to provide a mapping between the objects from the object oriented language and the relational database. As can be appreciated, such an embodiment can provide additional data beyond the type provided by common language runtime types. Additionally, such an embodiment can provide a system in which applications need not be rebuilt and redeployed if the manner in which data is persisted changes or if table names change or tables are broken into smaller tables within a relational database.

The foregoing embodiment is recited in independent claim format as a method in claim 34, as a storage medium storing computer-executable instructions to perform the method of claim 34 in claim 39, and as a system in claim 40 designed to perform the method recited in claim 34.

With regards to the substantive rejections, it is noted that independent claim 34 was rejected as being unpatentable over Wotring, Wang, Ludwig, Chua, and Koller. However, Applicant respectfully submits that the rejections are moot in view of at least the current amendments. Particularly, all of the above references, considered either alone or in combination, fail to teach or suggest each of the limitations of the current claims in independent claims 34, 39, and 40.

Wotring is generally directed towards embodiments for transforming data from one format utilized in a relational database to another format utilized by a hierarchal data entity so that it can be shared between the two without having to modify the original data structure. The hierarchical data entity is defined in terms of simple and compound elements, and database fields from the relational database are mapped to the elements. The relational database entries are then transformed into the corresponding mapped elements in the hierarchical data entity to form a hierarchical data structure.

Wang is generally directed towards embodiments of generating instructions to manipulate target objects and relationships in a relational database when the source object is manipulated, the source object having a one-to-many relationship with the target objects. The instructions are generated using meta-data containing information mapping object classes of the object model to tables in the relational database and mapping relationships to foreign keys.

Ludwig is generally directed towards embodiments of creating a remoteable proxy object from a user object, and assigning that proxy object an alias. When created, the system generates all of the interface definitions that are able to be proxied. When deployed, the application also deploys the proxy object at the client machine so it can access the original object at the server. At runtime, the application resolves whether to use the original object, the proxy object, or to use both a real version and a proxy version of the object.

Chua is generally directed towards embodiments of managing and serving multiple versions/releases of the same program from a single application server. Java Naming and Directory Interface (JNDI) proxies are placed between each client and the application server, and on the application server between related applications. The JNDI proxies allow a single public service name to be utilized by different clients to access different programs or services on the server. The JNDI proxies translate the public service name into a non-public alias name that the server understands and that designates a specific version of the program or services that the client needs. Because of the single call which translates to many versions, the clients are not version aware.

Koller is generally directed towards embodiments of constructing a learning probabilistic relational model (PRM) with attribute uncertainty from an existing database to discover patterns and dependencies in the data. Uncertainty as to the relationship between entities is modeled via two different mechanisms, reference uncertainty and existence uncertainty, and learning algorithms are provided for each of the models.

Applicant respectfully submits, however, that none of the cited references teach or suggest generating an object schema as described in the present independent claims. For example, the cited references fail to teach or suggest, among other things, **a persistence service class attribute** within the first data structure of the object schema, wherein the persistence service class attribute designates a persistence service to use when persisting the class associated with the attribute in the relational database as recited with all of the other claim limitations in the current independent claims. Instead, Wotring merely discloses the mapping of data in a relational database into a hierarchical data entity, with no teaching or suggestion of persisting data in a relational database and contains no teaching or suggestion of an attribute dictating what persistence service to use in persisting that data in the relational database. Further, the attributes Wotring discloses are attributes that describe a person, the person and attributes being used as an example of a hierarchical data entry. These attributes are distinguished from the attributes describing classes, members, and relationships as recited in the current independent claims. Wang, on the other hand, discloses metadata comprising descriptors that is a set of properties and mappings that describes how an object data is represented in a relational database, and contains no teaching or suggestion of a persistence service class attribute. (*See* Wang, col. 5 lines 17-30) Applicant further submits that none of Ludwig, Chua, nor Koller contain any teaching or suggestion of a persistence service class attribute. Thus, none of the cited references teach or suggest **a persistence service class attribute** within the first data structure of the object schema,

wherein the persistence service class attribute designates a persistence service to use when persisting the class associated with the attribute in the relational database as recited with all of the other claim limitations in the current independent claims.

Additionally, Applicant respectfully submits that none of the references teach or suggest **a key generator attribute** and **a key generator parameter attribute** within the second data structure of the object schema, wherein the key generator attribute designates a user class that is to act as a custom key generator and the key generator parameter attribute designates parameters to be passed to the custom key generator as recited with all of the other claim limitations in the current independent claims. Wotring merely discloses using a primary key in conjunction with relational database commands to map a hierarchical data entity from the elements of the relational database, with no teaching or suggestion of a key generator attribute or a key generator parameter attribute. (*See* Wotring, Figure 6). Wang merely discloses using primary and foreign keys in generating the instructions used to modify target objects when the primary object is modified, but contains no teaching or suggestion of generating keys, or of a key generator attribute and a key generator parameter attribute. Koller merely discloses using foreign and primary keys as unique identifiers of a database element and using the keys in analyzing relationships by the learning PRM, and contains no teaching or suggestion of a key generator attribute or a key generator parameter attribute. Applicant submits that neither Ludwig nor Chua contain any teaching or suggestion of a key generator attribute or a key generator parameter attribute. Therefore, Applicant respectfully submits that none of the references teach or suggest, among other things, **a key generator attribute** and **a key generator parameter attribute**, where the key generator attribute designates a user class that is to act as a custom key generator and where the key generator parameter attribute designates parameters to be passed to the custom key generator, and particularly as recited with all of the other claim limitations in the current independent claims.

Bigus, which was only cited for material contained in canceled claims and newly added dependent claim 46, also fails to compensate for at least the foregoing inadequacies of Wotring, Wang, Ludwig, Chua, and Koller. In particular, Bigus fails to teach or suggest a persistence service class attribute, a key generator attribute, or a key generator parameter attribute, and as recited with all the other limitations of the current independent claims.
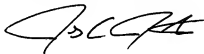
In view of at least the foregoing, Applicant respectfully submits that all the rejections to the independent claims are now moot and that the independent claims are now allowable over the cited

art, such that any of the remaining rejections and assertions made, particularly with respect to all of the dependent claims, do not need to be addressed individually at this time. It will be appreciated, however, that this should not be construed as Applicant acquiescing to any of the purported teachings or assertions made in the last action regarding the cited art or the pending application, including any official notice, and particularly with regard to the dependent claims.[1]

In the event that the Examiner finds remaining impediment to a prompt allowance of this application that may be clarified through a telephone interview, the Examiner is requested to contact the undersigned attorney at 801-533-9800.

Dated this 13 day of August, 2009.

Respectfully submitted,

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[1] Instead, Applicant reserves the right to challenge any of the purported teachings or assertions made in the last action at any appropriate time in the future, should the need arise. Furthermore, to the extent that the Examiner has relied on any Official Notice, explicitly or implicitly, Applicant specifically requests that the Examiner provide references supporting any official notice taken. Furthermore, although the prior art status of the cited art is not being challenged at this time, Applicant reserves the right to challenge the prior art status of the cited art at any appropriate time, should it arise. Accordingly, any arguments and amendments made herein should not be construed as acquiescing to any prior art status of the cited art.